

What is claimed is:

CLAIMS

- 1 1. A magnetic random access memory comprising:
2 a plurality of magnetic memory cells wherein each magnetic memory cell
3 comprises a free layer having an easy axis and a hard axis wherein the free layer is
4 curved with respect to said hard axis and the free layer is substantially straight with
5 respect to said easy axis.
- 1 2. The magnetic random access memory of claim 1 wherein each magnetic
2 memory cell further comprises a substrate having a plurality of grooves that are
3 substantially parallel to the easy axis of the free layer.
- 1 3. The magnetic random access memory of claim 2 wherein at least a portion
2 of said free layer is positioned over one of the grooves of the substrate.
- 1 4. The magnetic random-access memory of claim 2 comprising a copper wire
2 incorporated into at least one of the grooves.
- 1 5. The magnetic random-access memory of claim 4 wherein the wire is
2 incorporated into the groove such that the wire has a concave shape or a convex shape.

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1 6. The magnetic random access memory of claim 1 wherein each magnetic
2 cell further comprises a reference layer.

1 7. The magnetic random access memory of claim 6 wherein said reference
2 layer is substantially curved with respect to said hard axis and substantially straight
3 with respect to said easy axis.

1 8. The magnetic random access memory of claim 6 further comprising a
2 barrier layer positioned between said reference layer and said free layer.

1 9. The magnetic random access memory of claim 1 wherein the free layer
2 comprises a shape of the arc of a circle.

1 10. An information processing system comprising a processor, a memory and
2 an input/output interface, wherein the memory comprises a magnetic random-access
3 memory comprising a substrate and a plurality of magnetic cells each comprising a
4 magnetic region having an easy axis and a hard axis wherein said magnetic region is
5 substantially curved with respect to the hard axis and substantially straight with
6 respect to said easy axis.

1 11. The information processing system of claim 10 wherein the substrate
2 comprises a plurality of grooves substantially parallel to the easy axis of the magnetic
3 region.

1 12. The information processing system of claim 11 wherein said magnetic
2 region comprises a curved free layer located over one of the grooves of the substrate.

1 13. The information processing system of claim 11 comprising a wire
2 incorporated into at least one groove.

1 14. The magnetic random-access memory of claim 13 wherein the wire is
2 incorporated into the groove to form a concave shape or convex shape.

1 15. The information processing system of claim 10 wherein each magnetic cell
2 comprises a stack comprising a reference layer, a free layer and a barrier layer.

1 16. A method of producing a magnetic memory cell having a free layer, a
2 barrier layer and a reference layer, said method comprising:
3 forming said free layer such that a portion of said free layer is curved.

1 17. The method of claim 16 wherein the step of forming said free layer
2 comprises creating curved regions in a substrate layer and depositing said free layer
3 over said curved regions to produce said curved free layer.

1 18. The method of claim 16 further comprising producing said reference layer
2 such that a portion of said reference layer is curved.

1 19. The system of claim 14 further wherein said curved portion of said free
2 layer is constructed by etching grooves in the substrate layer and depositing said free
3 layer over said etched substrate layer.

1 20. The method of claim 19 further comprising forming a write wire in
2 portions of said etched grooves.